

WHAT IS CLAIMED IS:

1. A method for fabricating an NAND type non-volatile ferroelectric memory cell, comprising the steps of:
 - (1) forming an N number of wordlines on a first conduction type semiconductor substrate at fixed intervals;
 - (2) forming ferroelectric capacitor first electrodes over the wordlines excluding an (N)th wordline with a barrier metal disposed inbetween;
 - (3) forming source and drain regions in the substrate on both sides of the ferroelectric capacitor first electrodes;
 - (4) forming a ferroelectric film at sides and top of the ferroelectric capacitor first electrodes;
 - (5) forming ferroelectric capacitor second electrodes on the ferroelectric film;
 - (6) forming plugs for connecting the source and drain regions to the ferroelectric capacitor second electrodes adjacent to the source and drain regions respectively excluding the first region and the (N)th region of the N numbers of the source and drain regions; and,
 - (7) bitlines formed on the substrate inclusive of the plugs with an insulating layer disposed inbetween for electrically connection to the first region and (N)th region of N number of the source and drain regions.

2. A method as claimed in claim 1, wherein the steps (1) and (2) includes the steps of;

(10-1) forming a gate insulating film on a first conduction type semiconductor substrate;

(10-2) forming a wordline material layer on the gate insulating film;

(10-3) forming a barrier metal layer on the wordline material layer;

(10-4) forming a capacitor electrode material layer on the barrier metal layer; and

(10-5) selectively removing the capacitor material layer, the barrier metal layer, the wordline material layer, and the gate insulating film, to form wordlines insulated from the substrate by the gate insulating film, and first electrodes with the barrier metal layer disposed between the first electrodes and the wordlines.

3. A method as claimed in claim 2, further comprising the step of stuffing a space between every adjacent wordlines with an insulating material until sides of the barrier metal layer are exposed after the step (10-5).

4. A method for fabricating an NAND type non-volatile ferroelectric memory cell, comprising the steps of:

(1) forming capacitor first electrodes in surfaces of a first conduction type semiconductor substrate at fixed intervals;

(2) forming wordlines on the first electrodes with a ferroelectric film disposed inbetween such that the first electrodes are aligned to edge portions of the wordlines, and forming a WEC electrode on one side of a last wordline;

(3) using the wordlines and the WEC electrode as masks in implanting second conduction type impurity ions, and conducting annealing to form source and drain regions; and,

(4) forming bitlines so as to be electrically connected to a first and a last regions of the source and drain regions.

5. A method as claimed in claim 4, wherein the capacitor first electrodes are formed by impurity ion implanting.

6. A method as claimed in claim 5, wherein the step (1) includes the steps of;
(14-1) coating photoresist on the first conduction type semiconductor substrate;
(14-2) patterning the photoresist to expose the substrate at fixed intervals;
(14-3) using the patterned photoresist in implanting impurity ions, and conducting annealing, to form first electrodes in surfaces of the substrate at fixed intervals.

7. A method as claimed in claim 4, wherein the step (2) includes the steps of;
forming a ferroelectric film on the substrate having the first electrodes formed thereon,
forming a wordline material layer on the ferroelectric film,

patterning the wordline material layer such that the first electrodes are aligned to edge portions thereof, to form the wordlines and the WEC electrode.

8. A method as claimed in claim 6, further including the step of forming a diffusion barrier for preventing diffusion of the ferroelectric film into the substrate before formation of the ferroelectric film.

9. A method as claimed in claim 6, further including the step of forming a diffusion barrier for preventing diffusion of the ferroelectric film into the wordline material layer after formation of the ferroelectric film.